

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): Process for recycling of PET-material, in which the PET-material to be processed is heated by movement and thereby is dried, crystallized and at least one of plasticized ~~or, respectively,~~ and molten, and subsequently, ~~if desired after filtering,~~ is processed to one of PET-granulate and PET-articles, characterized in that the supplied PET-material is processed in ~~two~~ first and second steps, wherein in the first step the PET-material is subjected to a pre-processing by subjecting it to mechanical power and thereby heating it and drying it at an elevated temperature, and simultaneously crystallizing it, and that then within the second step that precedes plasticizing ~~or, respectively,~~ melting, the PET-material is subjected to a main processing in which the PET-material under vacuum conditions is again dried and further crystallized by subjecting it to mechanical power, wherein ~~this~~ the main processing is performed at a temperature that is increased when compared with the pre-processing.

Claim 2 (currently amended): Process according to claim 1, characterized in that the material to be processed is at least one of pre-comminuted, ~~and/or~~ washed ~~and/or~~ pre-dried before the pre-processing step.

Claim 3 (currently amended): Process according to claim 1, characterized in that ~~also~~ the temperature of the ~~main processing~~ main-processing step is kept below the plasticizing temperature of the PET-material.

Claim 4 (currently amended): Process according to claim 1, characterized in that for PET-pieces and/or milled PET-bottles, the pre-processing step, ~~that preferably~~ is performed under environmental pressure, ~~is performed~~ at a temperature range of 140 to 190°C, ~~preferably 150 to 160°C,~~ and at simultaneous ~~mechanic~~ mechanical treatment or, respectively, applying power that causes heating, by means of at least one mixing and/or comminuting element,

wherein the average dwell-time of the PET-material or, respectively, the duration of pre-processing, amounts to 35 to 65 min, ~~preferably 40 to 60 min.~~

Claim 5 (currently amended): Process according to claim 1, characterized in that for PET-foils and/or PET-fibers and/or PET-flakes, the pre-processing step, ~~that preferably~~ is performed under environmental pressure, ~~is performed~~ at a temperature range of 170 to 200°C, ~~preferably 180 to 200°C~~, and at simultaneous ~~mechanic~~ mechanical treatment or, respectively, applying power ~~applying~~ that causes heating, by means of at least one mixing and/or comminuting element, wherein the average dwell-time of the PET-material or, respectively, the duration of pre-processing, amounts to 10 to 30 min, ~~preferably 10 to 15 min.~~

Claim 6 (previously presented): Process according to claim 1, characterized in that the PET-material is subjected to the pre-processing step in a continuous flow.

Claim 7 (currently amended): Process according to claim 1, characterized in that the pre-processed PET-material is subjected to an intermediate storage between the pre-processing step and the main-processing step, the duration of ~~this~~ the storage corresponds to 80 to 120 % of the duration of pre-processing step, and that the pre-processed PET-material is kept during the intermediate storage and/or during conveying to ~~main processing~~ main processing at a temperature that is ~~as constant as possible, in particular~~ between 130 to 190°C, ~~preferably 150 to 170°C.~~

Claim 8 (currently amended): Process according to claim 1, characterized in that during the main-processing step that is performed under vacuum, ~~in particular under~~ a pressure of less than 20 mbar, and ~~preferably less than 10 mbar~~, the pre-processed PET-pieces and/or the milled bottle material is one of mechanically treated at a temperature of 170 to 210°C, ~~preferably 180 to 200°C, or is~~ and subjected to a power introduction that causes heating by at least one, ~~preferably rotating,~~ mixing and/or comminuting element, wherein the average dwell-time of the PET-material or the duration of the main-processing step, respectively, amounts to 40 to 100 min, ~~preferably 50 to 90 min.~~

Claim 9 (currently amended): Process according to claim 8, characterized in that the main processing is performed at a pressure of ~~less than 20 mbar, preferably less than~~ 10 mbar.

Claim 10 (currently amended): Process according to claim 1, characterized in that at the main-processing step ~~that~~ is performed under vacuum, and the pre-processed PET-foils and/or PET-fibers are processed at one of a temperature of 160 to 210°C, ~~preferably 170 to 205°C, or, respectively, are subjected~~ and by subjecting them to a ~~mechanie~~ mechanical power introduction that causes heating by at least one mixing and/or comminuting element, wherein the average dwell-time of the PET-material or the duration of the main-processing step, respectively, amounts to 5 to 25 min, ~~in particular to 10 to 15 min.~~

Claim 11 (currently amended): Process according to claim 10, characterized in that the ~~main-processing~~ main-processing step is performed at a pressure less than 150 mbar, ~~preferably less than 50 mbar.~~

Claim 12 (previously presented): Process according to claim 5, characterized in that at least one rotating mixing and/or comminuting element is used.

Claim 13 (previously presented): Process according to claim 1, characterized in that the PET-material is comminuted before pre-processing to sizes of 15 to 25 mm.

Claim 14 (previously presented): Process according to claim 1, characterized in that the PET-material to be processed is pre-comminuted and/or washed and/or pre-dried before the pre-processing step.

Claim 15 (currently amended): Process according to claim 1, characterized in that the PET-material is supplied from a main-processing apparatus (4) to the extruder (8) under vacuum conditions ~~or, respectively, that the vacuum existing within the main-processing apparatus (4) acts into the inlet section of the extruder (8).~~

Claim 16 (currently amended): Apparatus for recycling of PET-material, in which the PET-material to be processed is dried, crystallized and at least one of plasticized ~~or, respectively,~~ and molten, and the melt, ~~if desired after filtering,~~ is processed to one of PET-

granulate and PET-articles, and for performing the a process according to claim 1, characterized by two having first and second processing steps, in the first of which there is provided the apparatus comprising a pre-processing device for carrying out the first step of pre-processing of the supplied PET-material a ~~pre-processing device (3)~~ having mechanical processing elements (5) for drying and simultaneously crystallizing the PET-material at elevated temperature and ~~that this first step is followed by a~~ an evacuable main-processing device for carrying out the second processing step, comprising an evacuable the evacuable main-processing device (4) having mechanical processing elements (5') for further drying, crystallizing and temperature increase of the PET-material supplied by the pre-processing device (3).

Claim 17 (currently amended): Apparatus according to claim 16, characterized in that the pre-processing device (3) ~~also~~ comminutes the PET-material.

Claim 18 (currently amended): Apparatus according to claim 16, characterized in that as well within the pre-processing device (3) as within the main-processing device (4) there is provided at least one rotating mixing and/or comminuting element (5, 5') which mechanically treats and heats the PET-material.

Claim 19 (currently amended): Apparatus according to claim 18, characterized in that for comminuting ~~in particular~~ one of PET-pieces and/or milled bottle material at least one mixing and comminuting element (5, 5') in the pre-processing device (3) rotates with a circumferential speed of 9 to 15 m/s and in the ~~main processing~~ main-processing device (4) with a circumferential speed of also 9 to 15 m/s.

Claim 20 (currently amended): Apparatus according to claim 18, characterized in that for comminuting ~~in particular~~ one of PET-foils, and/or PET-fibers and/or PET-flakes at least one mixing and comminuting element (5, 5') is provided ~~as well~~ within the pre-processing device (3) ~~as within~~ and the ~~main processing~~ main-processing device (4), which element, respectively, rotates with a circumferential speed of 15 to 35 m/s, ~~preferably 20 to 30 m/s.~~

Claim 21 (currently amended): Apparatus according to claim 16, characterized in that an intermediate storage means (6) is inserted between the pre-processing device (3) and the

main-processing device (4), the volume of ~~this~~ the storage means (6) ~~corresponds~~ corresponding to 100 to 200 % of the volume of the pre-processing device (3).

Claim 22 (currently amended): Apparatus according to claim 6 21, characterized in that between the pre-processing device (3) and the intermediate storage means (6) and between the intermediate storage means (6) and the main-processing device (4) a thermically isolated and/or heated conveyor unit (7) each is provided, ~~preferably a conveyor screw or an extruder.~~

Claim 23 (currently amended): Apparatus according to claim 16, characterized in that the volume of the main-processing device (4) amounts to 80 to ~~200%~~ 200 % of the volume of the pre-processing device (3), ~~in particular to 100 to 180 %.~~

Claim 24 (currently amended): Apparatus according to claim 16, characterized in that an extruder (8) is connected to the main-processing device (4), in which extruder the PET-material taken from the main-processing device (4) is heated to a temperature of 260 to 275°C and is plasticized or molten, respectively.

Claim 25 (currently amended): Apparatus according to claim 24, characterized in that the extruder (8) is gas-tightly or, respectively, vacuum-tightly connected to the main-processing device (4) and that the pressure within the inlet section of the extruder (8) is connected to the pressure within the interior of the main-processing device (4), or, respectively, that the pressure within the main-processing apparatus (4) corresponds to the pressure within the inlet section of the extruder (8).

Claim 26 (currently amended): Apparatus according to claim 24, characterized in that the extruder (8) comprises at least one de-gassing zone (9) to which a vacuum pump (10) is connected by which within the de-gassing zone (9) a pressure of less than 40 mbar, ~~in particular less than 10 mbar,~~ can be adjusted.

Claim 27 (currently amended): Apparatus according to claim 16, characterized in that a filtration device (11) for PET-melt is connected to the extruder (8) and that, ~~if desired,~~ a

device (12) for producing finished products or semi-finished products, ~~for example PET-granulate~~, is connected to ~~this~~ the filtration device (11).

Claim 28 (currently amended): Apparatus according to claim 27, characterized in that between the extruder (8) and the filtration device (11) a measuring device (13) for measuring the viscosity of the melt is disposed.

Claim 29 (currently amended): Apparatus according to claim 16, characterized in that the pressure in the main-processing device (4) is adjustable to less than 150 mbar, ~~preferably less than 20 mbar~~.

Claim 30 (currently amended): Apparatus according to claim 16, characterized in that an additional heating for the pre-processing device (3) and/or for the ~~main processing~~ main-processing device (4) is provided.

Claim 31 (new): Process for recycling of PET-material, in which the PET-material to be processed is heated by movement and thereby is dried and thereafter is one of plasticized and molten, wherein the PET-material is initially processed in first and second steps, wherein in the first step the PET-material is pre-processed by subjecting it to mechanical power to thereby heat and dry it at an elevated temperature, and wherein thereafter in the second step the PET-material is subjected to a main processing in which the PET-material is dried under vacuum conditions by again subjecting it to mechanical power, wherein the PET-material in the first step is crystallized simultaneously with drying, and wherein the PET-material in the second step is further crystallized, the second step being performed at a temperature that is higher than the temperature during the first step, and wherein, after the PET-material has been one of plasticized and molten, it is processed into one of a PET-granulate and PET-articles.

Claim 32 (new): Process according to claim 31, including at least one of pre-comminuting, washing and pre-drying the PET-material before pre-processing it.

Claim 33 (new): Process according to claim 31, including keeping the temperature of the main processing below a plasticizing temperature of the PET-material.

Claim 34 (new): Process according to claim 31, wherein the PET-material comprises at least one of PET-pieces and milled PET-bottles, and wherein the pre-processing is performed at a temperature range between 140 to 190°C by at least one of a mechanical treatment and applying power that causes heating and employs at least one of a mixing element and a comminuting element, and wherein at least one of an average dwell-time of the PET-material and/or duration of the pre-processing amounts to 35 to 65 min.

Claim 35 (new): Process according to claim 34, wherein the temperature range of pre-processing is between 150 to 160°C and the duration of pre-processing is 40 to 60 min.

Claim 36 (new): Process according to claim 31, wherein the PET-material comprises at least one of a PET-foil, PET-fibers and PET-flakes, wherein the pre-processing is performed at a temperature range of 170 to 200°C by at least one of a mechanical treatment and applying power that causes heating and employing at least one of a mixing element and a comminuting element, and wherein at least one of an average dwell-time of the PET-material and duration of the pre-processing amounts to 10 to 30 min.

Claim 37 (new): Process according to claim 36, wherein the temperature range for pre-processing is between 180 to 200°C and the duration of the pre-processing amounts to 10 to 15 min.

Claim 38 (new): Process according to claim 31, wherein the pre-processing is performed under a vacuum.

Claim 39 (new): Process according to claim 34, wherein the pre-processing is performed under ambient pressure.

Claim 40 (new): Process according to claim 31, including causing contaminants included in the PET-material to escape by using extended dwell-times during pre-processing.

Claim 41 (new): Process according to claim 31, wherein pre-processing is performed by subjecting the PET-material to a continuous flow.

Claim 42 (new): Process according to claim 31, including subjecting the pre-processed PET-material to an intermediate storage between the pre-processing and the main processing for a duration between 80 to 120 % of the duration of pre-processing, and keeping the pre-processed PET-material during at least one of the intermediate storage and conveying it to the main processing at a temperature that is substantially constant.

Claim 43 (new): Process according to claim 42, including keeping the temperature during the at least one of the intermediate storage and conveying it to the main processing between 130 to 190°C.

Claim 44 (new): Process according to claim 43, wherein the temperature is kept between 150 to 170°C.

Claim 45 (new): Process according to claim 31, including performing the main processing under vacuum, wherein the PET-material comprises at least one of pre-processed PET-pieces and milled bottle material and is one of mechanically treated at a temperature of between 170 to 210°C and subjected to a power introduction that causes heating with at least one of a mixing element and a comminuting element, and wherein an average dwell-time of the PET-material or the duration of the main processing amounts to between 40 to 100 min.

Claim 46 (new): Process according to claim 45, wherein the main processing is performed under a pressure of less than 20 mbar.

Claim 47 (new): Process according to claim 45, wherein main processing is performed under a pressure of less than 10 mbar.

Claim 48 (new): Process according to claim 45, wherein the mechanical treatment is performed at a temperature of between 180 to 200°C.

Claim 49 (new): Process according to claim 45, wherein the duration of main processing is between 50 to 90 min.

Claim 50 (new): Process according to claim 36, wherein the main processing is performed under a vacuum, wherein, during the main processing, the pre-processed at least one

of PET-foils and PET-fibers are subjected to one of at a temperature between 160 to 210°C and a mechanical power introduction that causes heating with at least one of a mixing element and a comminuting element, and wherein one of the average dwell-time of the PET-material and the duration of the main processing amounts to 5 to 25 min.

Claim 51 (new): Process according to claim 50, wherein the pre-processed at least one of PET-foils and PET-fibers are main-processed at a temperature between 170 to 205°C.

Claim 52 (new): Process according to claim 50, wherein the duration of the main processing amounts to between 10 to 15 min.

Claim 53 (new): Process according to claim 50, wherein the main processing is performed at a pressure of less than 150 mbar.

Claim 54 (new): Process according to claim 53, wherein the main processing is performed at a pressure of less than 50 mbar.

Claim 55 (new): Process according to claim 31, wherein subjecting the PET-material to mechanical power comprises using at least one of a rotating mixing element and a rotating comminuting element.

Claim 56 (new): Process according to claim 31, including at least one of pre-comminuting, washing and pre-drying the PET-material prior to pre-processing.

Claim 57 (new): Process according to claim 56, including comminuting the PET-material prior to pre-processing to particle sizes between 15 to 25 mm.

Claim 58 (new): Process according to claim 31, including supplying the PET-material from a main-processing apparatus to an extruder under a vacuum.

Claim 59 (new): Process according to claim 58, wherein the vacuum exists within the main-processing apparatus and extends into an inlet section of the extruder.

Claim 60 (new): Process according to claim 31, including filtering the PET-material after plasticizing or melting.

Claim 61 (new): Apparatus for recycling PET-material and heating the PET-material by subjecting the PET-material to movement in first and second processing steps, comprising a pre-processing device for the first step for pre-processing of the PET-material and having mechanical processing elements for drying and simultaneously crystallizing and increasing the temperature of the PET-material at an elevated temperature, an evacuable main-processing device for the second step for main processing the PET-material and having mechanical processing elements for further drying and crystallizing the PET-material supplied by the pre-processing device, and a further device for at least one of plasticizing and melting the material after the second processing step.

Claim 62 (new): Apparatus according to claim 61, wherein the pre-processing device comprises processing elements for comminuting the PET-material.

Claim 63 (new): Apparatus according to claim 61, wherein the mechanical processing elements of the pre-processing device and of the main-processing device each comprise at least one of a rotating mixing element and a rotating comminuting element each which mechanically process and heat the PET-material.

Claim 64 (new): Apparatus according to claim 63, wherein the PET-material comprises at least one of PET-pieces and milled PET-bottle material, and including at least one mixing element and one comminuting element in each of the pre-processing device and the main-processing device which rotates with a circumferential speed of between 9 to 15 m/s.

Claim 65 (new): Apparatus according to claim 63, wherein the PET-material comprises at least one of PET-foils, PET-fibers and PET-flakes, wherein at least one mixing element and one comminuting element is provided within each of the pre-processing device and within the main-processing device, and wherein the elements rotate with a circumferential speed of between 15 to 35 m/s.

Claim 66 (new): Apparatus according to claim 65, wherein the at least one mixing element and comminuting element rotates with a circumferential speed of between 20 to 30 m/s.

Claim 67 (new): Apparatus according to claim 61, including an intermediate storage device inserted between the pre-processing device and the main-processing device and having a volume between 100 to 200 % of a volume of the pre-processing device.

Claim 68 (new): Apparatus according to claim 67, including a conveyor unit which is at least one of thermically isolated and heated arranged between the pre-processing device and the intermediate storage device and between the intermediate storage device and the main-processing device.

Claim 69 (new): Apparatus according to claim 68, wherein the heated conveyor unit comprises one of a conveyor screw and an extruder.

Claim 70 (new): Apparatus according to claim 61, wherein a volume of the main-processing device is between 80 to 200 % of a volume of the pre-processing device.

Claim 71 (new): Apparatus according to claim 70, wherein the volume of the main-processing device is between 100 to 180 % of the volume of the pre-processing device.

Claim 72 (new): Apparatus according to claim 61, including an extruder connected to the main-processing device receiving the PET-material taken from the main-processing device and heating the PET-material to a temperature between 260 to 275°C to at least one of plasticize and melt the PET-material.

Claim 73 (new): Apparatus according to claim 72, wherein the extruder is connected to the main-processing device in a sealed manner, and wherein an inlet section of the extruder communicates with an interior of the main-processing device so that the pressure within the main-processing apparatus corresponds to the pressure within the inlet section of the extruder.

Claim 74 (new): Apparatus according to claim 72, wherein pressure within an inlet section of the extruder and within an interior of the main-processing apparatus are equal.

Claim 75 (new): Apparatus according to claim 72, wherein the extruder comprises at least one de-gassing zone and a vacuum pump connected thereto for maintaining a pressure in the de-gassing zone of less than 40 mbar.

Claim 76 (new): Apparatus according to claim 75, wherein the vacuum pump maintains the pressure within the de-gassing zone at less than 10 mbar.

Claim 77 (new): Apparatus according to claim 72, including a filtration device connected to the extruder for filtering the PET-material.

Claim 78 (new): Apparatus according to claim 77, including a product device for producing one of finished products and semi-finished products connected to the filtration device.

Claim 79 (new): Apparatus according to claim 78, wherein the product device produces PET-granulate.

Claim 80 (new): Apparatus according to claim 77, including a measuring device between the extruder and the filtration device for measuring a viscosity of the plasticized or melted PET-material.

Claim 81 (new): Apparatus according to claim 61, wherein a pressure adjuster coupled to the main-processing device regulates the pressure therein to less than 150 mbar.

Claim 82 (new): Apparatus according to claim 81, wherein the adjuster regulates the pressure in the main-processing device to less than 20 mbar.

Claim 83 (new): Apparatus according to claim 61, including an additional heating device for at least one of the pre-processing device and the main-processing device.

Claim 84 (new): A process according to claim 1 including filtering the PET-material before it is processed to one of PET-granulate and PET-articles.